PLTC-ER Communication Cable — What It is and Why You Want It

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Designing cabling solutions for industrial applications presents a myriad of challenges. The industrial environment is unforgiving. Handling is rough, exposure to harsh chemicals and solvents degrade cables causing failures, and it is an environment that sees cable crushed, dropped, and continuously flexed. The abuse causes costly failures and even safety hazards.

While several types of cables have found their way into the setting, including armored, harsh environment CM and even commercial-grade CM cable, there is finally a new solution that addresses the shortcomings of what currently exists, while dramatically expanding cable benefits.

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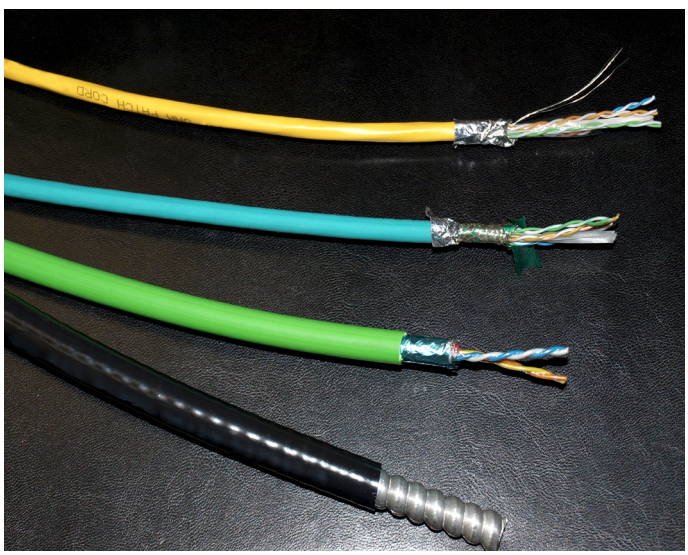
Armored Cable

When transmitting power or data, protecting cables is crucial to safe and reliable operation. Armored cable is constructed with a metal sheath, usually made of interlocking or continuous aluminum or stainless steel, or smooth or corrugated metal tape.



Pictured here are: a typical armored cable (bottom), Quabbin's PLTC-ER cable, a CM-rated Harsh Environment cable, and a CM-rated commercial cable.

Industrial metal-clad armored cables feature a grounding wire within the cable bundle, so that they can be used in factories, throughout raceways, cable trays, and carriers. Armored cable use in industrial settings are IP67-rated and certified to UL and NEC standards.

There are challenges with armored cable use, however, including its tendency to fracture at one spot when bent repeatedly. It does not hold up well in damage-based situations, which commonly occur when crushed, hit, flexed until it breaks, run over, or is subject to items falling on it—it is often too easily destroyed.

Installation of armored cable is a big task given its metal must be stripped and the cable connected, requiring specialized tools. Installation also involves injuries given the metal's sharp edges. An armored cable is heavy, so shipping costs are high and the heaviness of the cable, when attached to a moving part of a machine, takes a toll.

Harsh Environment CM Cable

CM cables that were designed for harsh environments do have some limitations and cannot

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be used in "hazardous" (or classified) locations as defined by the electric code; their use could be problematic in the wrong application. Although they can be bent repeatedly and have light-weight advantages, they do not stand up well to crush events and can only be used in exposed lengths of up to 10 ft.

Until now, harsh environment cable and commercial cable had a CM rating, specifically for building wiring, along with stringent rules as to how it must be installed.

Commercial Grade CM Cable

Cable Attributes	PLTC-ER Cable	Armored PLTC Cable	CM or Equal Harsh Environment Cable	Commercial Grade Cable CM
Appropriate for Industrial Use	Excellent	Excellent	Excellent	Poor
Crush Resistant	Excellent	Excellent	Fair	Poor
Instalation Ease	Excellent	Good	Good	Poor
Hi-Flex (bend repeatedly)	Excellent	Poor	Excellent	Fair
Ratings Code Compliant for Industrial Use	Excellent	Excellent	Good	Good
All-Purpose Applications	Excellent	Fair	Good	Poor
Unprotected Long Lengths	Excellent	Excellent	Fair	Poor
Cost	Good	Poor	Good	Excellent
Weight	Good	Fair /Poor	Excellent	Excellent

Table 1. Feature comparison chart for cable types from PLTC-ER to commercial-grade cables.

Commercial-grade cable is not designed for the harsh environments that exist in industrial settings. The materials used and its construction, are not suitable for the rough and extreme environments involved in manufacturing. Instead, it is used more often in air-conditioned datacenter applications. CM cable is designed to be put in the wall, or for a short length, outside of a wall.

Given the lack of a solution that could address all important criteria for industrial use, until now, armored and harsh-environment cables were the go-to cables for industrial settings. While attributes of each met certain industrial requirements, failures and short lifetimes were also common. These failures resulted in production delays and the resulting downtime is extremely costly. Designers of cabling systems had no choice other than to use what was available. Now they do.

PLTC ER Cable

Power Limited Tray Cable Exposed Run (PLTC ER), also called "open wire" cable, is an industrial-grade solution that can be installed without the use of a conduit or a tray. PLTC ER cable meets the crush and impact requirements of metal-protected cable, and can be dropped out of cable trays to equipment and devices, or dropped from tray to tray. Eliminating the use of armor as cable protection translates into several benefits for the user, including the reduction of both installation time and cost.

How tough is it? To earn the ER designation, cable must pass rigid testing including a 1,000-lb. crush test without shorting out or cutting into the insulation, as well as dropping a 10-lb. weight on it from the height of one foot without shorting or insulation damage. Quabbin takes ER testing further by adding an impressive 10-million-cycle flex test, ensuring that the cable is appropriate for use in robotics applications. In addition, Quabbin's PLTC ER cable is resistant to UV, flame, and weld-splatter. During spot welding, for example, when hot pieces of metal fly off, they won't stick to the ER cable, attributable to Quabbin's jacket construction material. By using a PLTC ER solution, one cable can be run various places instead of purchasing a variety of different cables for every part of an installation.

In addition to the added features, while there are a few PLTC ER cables available, the Quabbin solution stands alone as the only ER data cable available in the marketplace, providing industrial Ethernet to the industrial space. Rugged, fully tested, and available, PLTC ER is specifically rated for use within hazardous environments.

Compliance with NEC Codes

At the heart of the National Electric Code (NEC), as to PLTC ER compliance, is that the cables are approved for use in hazardous or classified locations without the protection mandated for other solutions. PLTC-rated cable, in comparison, cannot run unprotected outside a cable tray or raceway, or be dropped from tray to tray for distances up to 10 ft.

Subject to local authority and best design practices, PLTC ER exposed cable can be run up to 50 ft., without putting it

into conduit, adding to its ability to be not only an approved solution, but one that is installation and maintenance cost effective.

Cost Savings

While ER cable itself is slightly more expensive, the savings is revealed in installation, its long life, lower maintenance requirements and the elimination of the conduit, raceway and metal armor. ER connectors, while more expensive, have an extremely low failure rate. All things considered, an equivalent cable that is not ER is substantially more expensive.

While standard tray cables cannot extend more than six feet outside a tray without armor or a raceway, ER rated cables can go more than 50 ft. if there is sufficient protection and support, eliminating the number of cables used. The PLTC ER has a long life and Quabbin ER cable is unique in that it can be flexed millions of times without failure, expanding cable endurance even more.

PLTC ER Applications

Applications for PLTC ER cable include motor controllers, automation, and machine vision. Automation and machine vision involve control of robotic movement and the ability to see what the robot is doing, respectively. PLTC ER cable combines toughness and ease of use. Within the industrial environment, PLTC ER is appropriate for new installations, equipment upgrade, and may also replace existing cable where there is a high failure rate.

There's no doubt that, given PLTC-ER features, the solution will rapidly move into effectively, efficiently, and cost-effectively cabling the industrial space.

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ABOUT QUABBIN WIRE & CABLE CO., INC.

At Quabbin, the focus is on being the best we can be and manufacturing the best products on the market — not just compliant, better than compliant. That's who we are; the desire to produce world beating products is our foundation. After that it comes down to holding tighter tolerances in the manufacturing facility and we do it consistently. We do this by having two dedicated plants, one designed to run Ethernet only, while the other is designated for General Purpose cable. This allows our operators to maximize efficiency and perfect every cable that is being made. Designing and producing the cable is only half of the equation. Every employee from Engineering to Shipping works in unison to deliver the best cable for your application needs. For more information, visit **https://www.quabbin.com**.